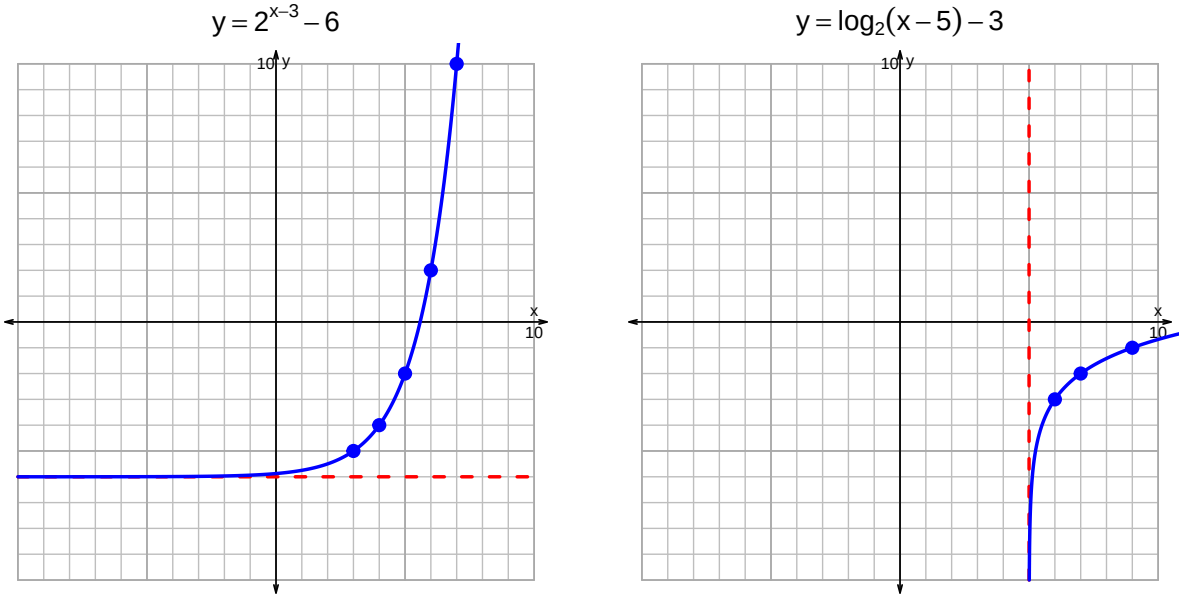
Name: Date:

s18quiz: EXP LOG (Solution v101)

1. Graph $y = 2^{x-3} - 6$ and $y = \log_2(x-5) - 3$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$17 = \left(\frac{4}{5}\right) \cdot 2^{-7t/3}$$

Divide both sides by $\frac{4}{5}$.

$$\frac{17 \cdot 5}{4} = 2^{-7t/3}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{17 \cdot 5}{4}\right) = \frac{-7t}{3}$$

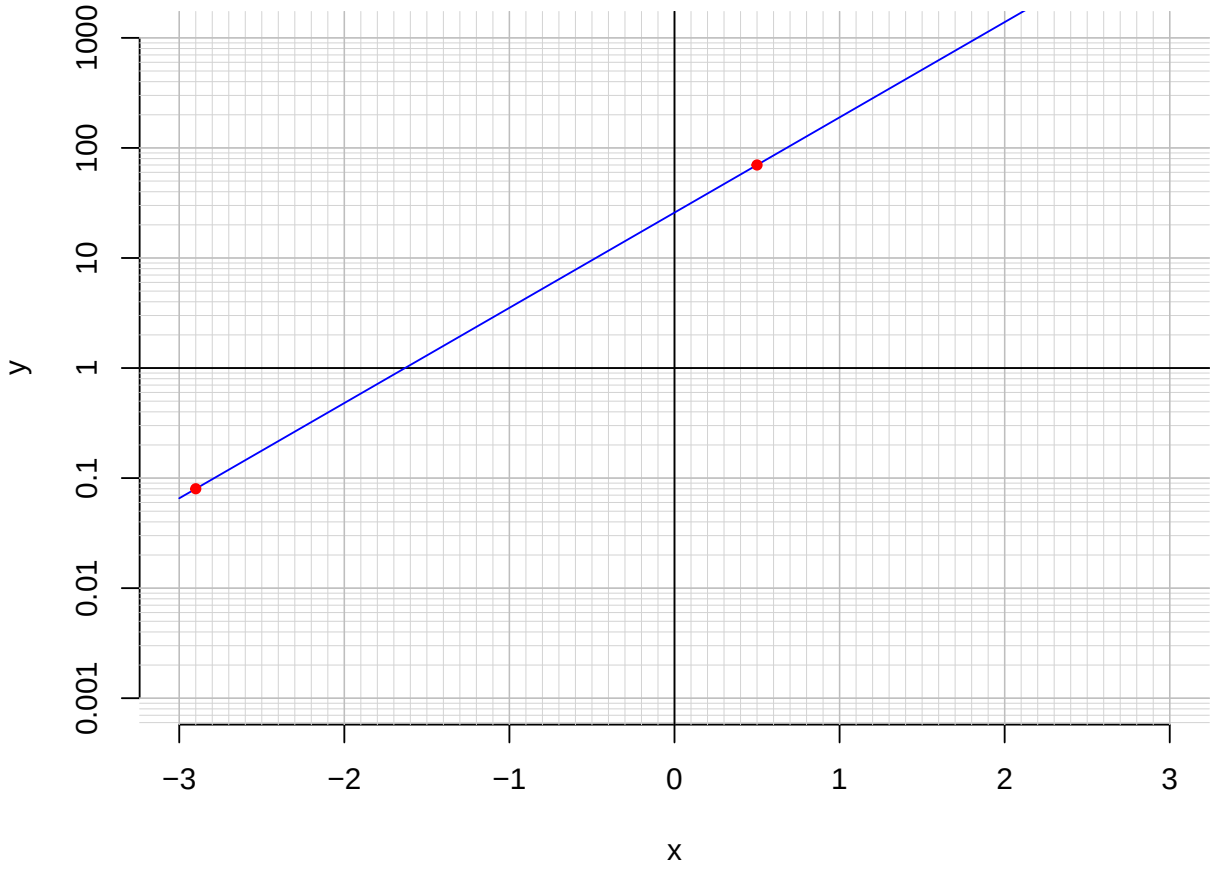
Divide both sides by $\frac{-7}{3}$.

$$\frac{-3}{7} \cdot \log_2\left(\frac{17 \cdot 5}{4}\right) = t$$

Switch sides.

$$t = \frac{-3}{7} \cdot \log_2\left(\frac{17 \cdot 5}{4}\right)$$

3. An exponential function $f(x) = 25.8 \cdot e^{1.99x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.9)$.

$$f(-2.9) = 0.08$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{1.99} \cdot \ln\left(\frac{x}{25.8}\right)$$

c. Using the plot above, evaluate $f^{-1}(70)$.

$$f^{-1}(70) = 0.5$$